



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/534,922

01/30/2006

Philip John Hogg

05-363

1798

20306

7590

05/29/2008

MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP  
300 S. WACKER DRIVE  
32ND FLOOR  
CHICAGO, IL 60606

EXAMINER

STONE, CHRISTOPHER R

ART UNIT

PAPER NUMBER

1614

MAIL DATE

DELIVERY MODE

05/29/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/534,922	<b>Applicant(s)</b> HOGG, PHILIP JOHN	
	<b>Examiner</b> CHRISTOPHER R. STONE	<b>Art Unit</b> 1614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 6-8, 20-22 and 24-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-19, 23, 27 and 28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

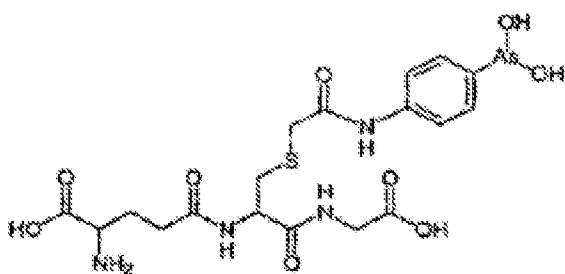
### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/09/2005, 04/11/2008</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election with traverse of Group I (claims 1-5 and 9-28) and the compound species shown below in the reply filed on December 12, 2007 is acknowledged.



The traversal is on the ground(s) that Groups I-IV and the compounds of formula I have unity of invention; therefore all claims and compounds should be examined. This is not found persuasive because Groups I-IV and the compounds of formula I do not share a common special technical feature because compounds capable of selectively inducing MPT, specifically compounds of formula I do not make a contribution over the prior art because they are not novel (see Requirement for Restriction mailed September 13, 2007, p. 2). Therefore a holding of lack of unity of invention is proper.

The requirement is still deemed proper and is therefore made FINAL.

Claims 6-8, 20-22 and 24-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions/species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on December 12, 2007.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 9-19, 23, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Constantini et al (Oncogene, 2000, Vol. 19, p. 307-314, provided by Applicant) in view of Hogg et al (WO 01/21628), further in view of Sawada et al (US Patent 5270196).

Claims 1-3, 9-19, 23, 27 and 28 are drawn to a method for identifying the elected compound which selectively induces mitochondrial permeability transition (MPT) in proliferating cells comprising contacting a cell or cell extract with the elected compound, determining whether the compound binds to the adenine nucleotide translocator (ANT) and determining whether the compound selectively induces the MPT in proliferating cells, relative to non-proliferating cells.

Constantini et al teaches that agents that are able to bind ANT induce MPT, which then causes apoptosis (abstract and p. 311, right column, first paragraph). Said agents are additionally taught to be useful as cytotoxic agents in the treatment of cancer (p. 312, left column, first paragraph). Constantini et al further teaches that MPT is associated with cellular release of cytochrome C (p. 307, left column, last paragraph to right column, first paragraph) Constantini et al does not teach the elected compound or the method further comprising determining whether the compound selectively induces

Art Unit: 1614

the MPT in proliferating cells, relative to non-proliferating cells. Hogg et al teaches that the elected compound is useful in the treatment of proliferative diseases, including cancer (compound of formula IV, where  $-\text{As}=\text{O}$  is replaced by the arsenoxide equivalent,  $-\text{As}(\text{OH})_2$ , p. 10, lines 18 and 19, p. 12, lines 8-10, p. 13, lines 29 and 30, claims 40-42). Sawada et al teaches that a major problem with cancer chemotherapy is the nonspecific action of anti-tumor agents, which causes damage to normal (growth quiescent cells) and agents which selectively act on tumor cells are desirable (column 1, lines 19-24). Therefore it would have been obvious to one of ordinary skill in the art at the time of the instantly claimed invention to practice the instantly claimed method to identify the known cytotoxic elected compound which selectively induces mitochondrial permeability transition (MPT) in proliferating cells comprising contacting a cell or cell extract with the known elected compound, determining whether the compound binds to the adenine nucleotide translocator (ANT) and determining whether the compound selectively induces the MPT in proliferating cells, relative to non-proliferating cells, since it was known that binding to ANT is indicative of stimulating MPT and MPT causes apoptosis and this activity was known to be useful for the treatment of cancer.

Determining whether this activity is present only in proliferating cells (i.e. cancer cells) would have obvious to one of ordinary skill in the art because of the known complication of non-specific chemotherapy agents causing damage to normal (growth quiescent) cells. Additionally it would have been obvious to one of ordinary skill in the art at the time of the instantly claimed invention to measure the induction of MPT by measure cytochrome C release, since it was known that MPT is associated with cellular release

Art Unit: 1614

of cytochrome C, thus resulting in the practice of the instantly claimed invention with a reasonable expectation of success.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Constantini et al (Oncogene, 2000, Vol. 19, p. 307-314, provided by Applicant) in view of Hogg et al (WO 01/21628), Sawada et al (US Patent 5270196) and Cai et al.

Constantini et al, Hogg et al and Sawada et al teach the aforementioned method, but do not the method comprising determining the induction of MPT by measuring cellular superoxide concentration. Cai et al teaches that an increase in cellular superoxide is associated with MPT (abstract). Therefore it would have been obvious to one of ordinary skill in the art at the time of the instantly claimed invention to determine the induction of MPT by measuring cellular superoxide concentration, since determining MPT was known to be useful in the above method, and increased cellular superoxide was known to be associated with MPT.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER R. STONE whose telephone number is (571)270-3494. The examiner can normally be reached on Monday-Thursday, 7:30am-4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin H. Marschel can be reached on (571) 272-0718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1614

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

13May2008

/Ardin Marschel/  
Supervisory Patent Examiner, Art Unit 1614